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LOUISIANA
# Conservationist

January/February 1986

January 1, 1986

Hunter Safety Volunteers
Statewide

Dear Volunteer Instructor,

I have been saying a lot recently about the need for hunter safety and ethics as I am firmly committed to both. Likewise, I am just as committed to mandatory hunter safety education, because I feel it is the best and possibly the only method of producing a generation of sportsmen who are committed to preserving the sport of hunting and making it the safe and pleasurable pursuit it rightly deserves to be.

When the 1984 Louisiana Legislature approved mandatory hunter safety education effective for the 1985-86 hunting season, one of the major concerns expressed was whether the department's hunter safety education staff would be able to handle the expected two-fold increase in the number of persons seeking hunter safety certification.

Those estimates proved correct, as the number of individuals seeking certification skyrocketed from a yearly average of just under 10,000 to more than 21,000. Likewise, the number of student courses jumped from an average of approximately 350 annually to 644.

Were it not for you, the volunteer instructor, we would not have been able to meet this challenge. It was your unselfish commitment to the sport of hunting and the safety of others that made it all possible.

Last year, 540 unselfish Louisiana sportsmen committed 14 hours of their time to taking and passing the rigorous hunter safety instructor certification course. They then joined the 700 already certified volunteer instructors and together this small army of 1,243 volunteers provided almost 6,500 hours of instruction and certified 21,591 students.

To me, the real significance lies not in these numbers, impressive as they are, but rather in the personal sacrifice of each and every one of you, both in terms of time and money. The average active volunteer instructor dedicated approximately 40 hours of his time to classroom instruction alone. This was time on weekends and at night when others were at home with their friends and families and does not include the countless hours spent in preparation and travel.

Often using your own equipment and vehicles and traveling at your own expense, you contributed more than just time, you also gave freely of your hard earned money.

Still, even these observations and figures do not tell the whole tale. Until you've given a hunter safety course, it's hard to comprehend the work involved. Just preparing 10 hours of meaningful instruction is in itself quite a task, but when you add to this the unenviable task of presenting this 10 hours to a class of active 10 to 14 year olds, count the effort spent giving and grading tests, moving heavy and bulky equipment and safely conducting live firing exercises, it begins to take on almost herculean proportions.

In comparison, my simple thank you seems woefully inadequate. I salute you and offer it nonetheless.

Thank you.

Sincerely,

J. Burton Angelle Sr.
Secretary

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# LOUISIANA Conservationist

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# Rigs to Reefs

By **Villere Reggio**, *Minerals Management Service*; **Virginia Van Sickle**, *Louisiana Geological Survey*, and **Charles Wilson**, *Coastal Fisheries Institute*

***Other countries spend millions each year building artificial reefs to enhance fishing. Louisiana has the opportunity to duplicate those efforts at virtually no expense to the state.***

HAVE YOU LOST A RIG lately? Many coastal fishermen are finding that their favorite offshore petroleum platform ("rig") has disappeared, and current plans are to remove two-thirds of the remaining rigs in the Gulf by the year 2000. Even our most popular fishing spots such as the Green Monster, Grand Isle 43AA, the Sulphur Rig and West Delta 41 will be scheduled for removal.

Under present regulations, the petroleum industry is required to remove its offshore platforms after they cease to produce oil and gas. These platforms are not simply transported to another area of the Gulf for reuse; they are towed to shore where they are dismantled and scrapped. Over the next 15 years the projected cost for onshore dismantling and disposal of retired oil and gas rigs will average over $1 million per structure. The economic impact of removing these structures on the state's economy may prove to be equally staggering.

Since the first offshore platform was installed in 1937, a multi-million dollar recreational fishery has developed off the Louisiana coast. Approximately 250,000 saltwater fishermen in Louisiana rely on oil and gas rigs for most of their offshore fishing. Offshore rigs function as de facto "artificial reefs" and are the primary destination of over 60 percent of all offshore recreational fishing trips originating in Louisiana. They are also used by many commercial fishermen from Louisiana and all other gulf coast states.

Offshore rigs are widely known as fish havens. These gigantic steel structures provide an important source of hard substrate in an otherwise soft-bottom environment.

Hard substrate is necessary for the establishment of a marine reef. Communities of corals, bryzoans, barnacles, mussels and other encrusting organisms require a hard surface for attachment. The supporting structure of a petroleum platform provides such surface area. Additional hard bottom habitat is created on the sea floor under each platform, as rock chips accumulate during drilling operations. This "cuttings pile" is enlarged by shells that fall off the legs of the platform, creating a hard mound up to 15 feet deep.

A typical oil and gas structure in 150 feet of water can provide up to 2 acres of underwater surface area. This artificial reef habitat is particularly important off Louisiana, where natural reefs are scarce and mostly located in water depths between 400 and 600 feet, over 100 miles offshore.

The sessile community formed on, under, and around oil and gas structures forms the base of a food chain which supports a wide variety of fish and shellfish. Angelfish, parrotfish, spiny lobster and a dazzling array of rainbow-hued tropical fish quickly establish homes around deep, blue-water structures off the Louisiana coast.

The 3,600 oil and gas structures currently located off the Louisiana coast provide a total of over 4,000 acres of vital reef habitat. There is more hard substrate associated with these platforms than exists in all of the natural reefs and hard "banks" off the Louisiana coast.

Artificial reefs augment local fishery habitats and carrying capacities thereby maintaining, diversifying and increasing fish and shellfish stocks. Because of the additional reef habitat provided by oil and gas structures, Louisiana fishermen have enjoyed the most consistent and productive offshore recreational fishery in America. Where else do private recreational fishermen measure a day's fishing success in the number of ice chests filled? Where else do charter boat captains report their catch in hundreds of pounds per boat per day?

A single petroleum platform harbors 20 to 50 times more fish than do nearby soft bottoms in the Gulf. Recent studies conducted by the National Marine Fisheries Service (NMFS) confirmed that most Louisiana offshore fishermen fish next to oil and gas structures and that their average fishing success (catch per unit effort) is far greater than offshore fishermen from any other Gulf or South Atlantic state. According to a 1984 NMFS survey, the average Louisiana offshore recreational fisherman catches between 17 and 20 fish per trip.

The major species targeted and caught by recreational fishermen around offshore platforms are red snapper, white trout, bull croaker, king mackerel and lemonfish. Prolific quantities of excellent tablefish such as spadefish, blue runner, triggerfish, sheepshead, and sharks are also available for harvest, but are largely ignored because of the abundance of the more traditional species. Rig fishing is productive year-round, but catch rates vary with season, location, water depth and fishing pressure.

Distance traveled appears to be among the most important factors determining which rigs are used most by fishermen. Rig fishing by the private boat recreational fisherman is most popular within 10 miles of shore during summer weekends. A study conducted by the U.S. Department of Interior with the assistance of the offshore oil and gas companies indicates that most commercial charter boat fishing occurs within 25 miles of shore, in water depths less than 200 feet.

Unfortunately for Louisiana saltwater anglers, the nearshore rigs are the first ones being removed. The Louisiana Outer Continental Shelf (OCS) is the most mature offshore oil and gas producing region in the world. Offshore technology was pioneered in Louisiana, as was OCS oil and gas production, almost 50 years ago. The nearshore, shallow-water fields were the first developed. They are the first being depleted, and they will be the first to be abandoned. Federal OCS regulations require oil and gas lessees to "remove all devices, works and structures from the premises" within one year after lease termination. This requirement has prevented the dumping of oil and gas equipment and structures in a manner which would create hazards to navigation or obstructions to other activities, such as shrimp trawling.

The Marine Board of the National Research Council projected that 1,625 rigs will be removed from the Louisiana OCS by the year 2000. More than 90 percent of these structures are located in nearshore waters less than 100 feet deep. They will be removed over the next 14 years at a cost exceeding $1 billion.

Approximately 400 platforms have already been removed from offshore Louisiana. Over 300 are projected for disposal during the next 5 years.

Congressman John Breaux undoubtedly had his south Louisiana constituency and their de facto oil and gas fishing reefs in mind when he skillfully guided the National Fishing Enhancement Act through the United States Congress. Title II of Public Law 98-623 signed by President Reagan on November 8, 1984, established a national policy and guidelines to promote the development of good artificial fishing reefs. Louisiana is in the enviable position of having 3,600 artificial reefs already functioning off its coast. Our challenge is to determine which ones to leave in place and which ones to move to sites where they can be used to form reef complexes. Perhaps an even greater challenge lies in identifying a way to deal with ownership and liability.

In most cases it will cost less for an oil company to donate and deliver a retired oil and gas structure to a permitted artificial reef site near its present location in the Gulf than to dispose of it onshore. Oil companies such as Marathon, Tenneco and Exxon have demonstrated a willingness to donate and deliver rigs to reef sites as far away as Florida and Alabama. Florida has the most active artificial reef program with over 178 sites permitted thus far, and three of these sites utilize imported oil and gas structures. Florida counties, regional planning agencies, fishermen's groups, charter boat associations and state agencies have become increasingly involved in acquiring rigs from the Louisiana coast for their artificial reefs program.

Rigs are preferred artificial reef material because of their proven ability to provide excellent fishery habitat

**Louisiana rig on way to Florida**

**Old Tenneco rig now Florida reef**

and because of their tendency to stay where they are put. Their high profile, open spaces, large surface area and durability make them better suited for artificial reefs than any "materials of opportunity" used by other states.

The Japanese government spends in excess of $100 million per year on the world's most elaborate artificial reef program. The steel structures built by the Japanese strongly resemble the oil and gas structures that we consider "obsolete" after they no longer produce oil and gas.

There is a great incentive and an unprecedented opportunity for Louisiana's fishery scientists to design a comprehensive, permanent artificial reef system which could be built from rigs willingly supplied by the oil and gas industry. Although there will likely be enough structures available to satisfy the artificial reef demands of the entire Gulf region, Louisiana is in the unique position of having the right of the first refusal . . . because it will always be cheaper to dispose of a structure closest to its original location.

Louisiana has all of the ingredients needed to build this country's most productive artificial reefs system: the rigs, a major fisheries industry and willing oil and gas companies. These ingredients provide us with the opportunity to organize the political, scientific and administrative forces necessary to sustain and enhance our offshore fishing industry through artificial reefs.

With careful planning and wise use, our offshore petroleum platforms can keep on producing fish for decades to come, enhancing the utilization of another valuable, and renewable, natural resource.

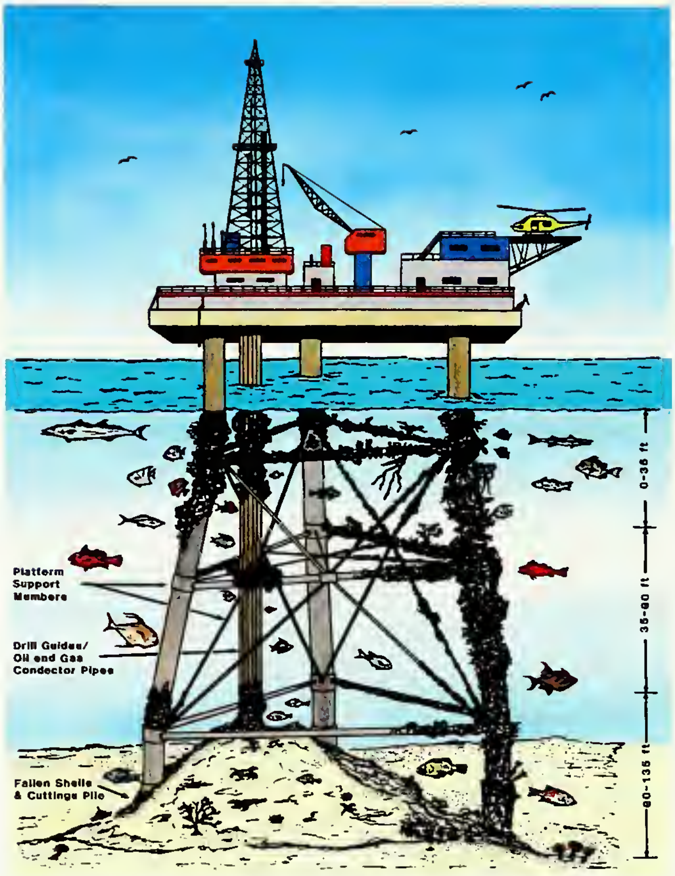
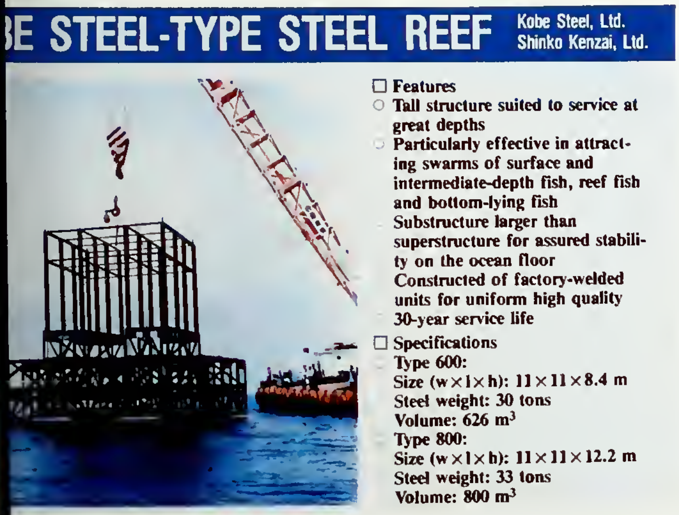


Diagram courtesy Paul Driessen and Will Fournerat



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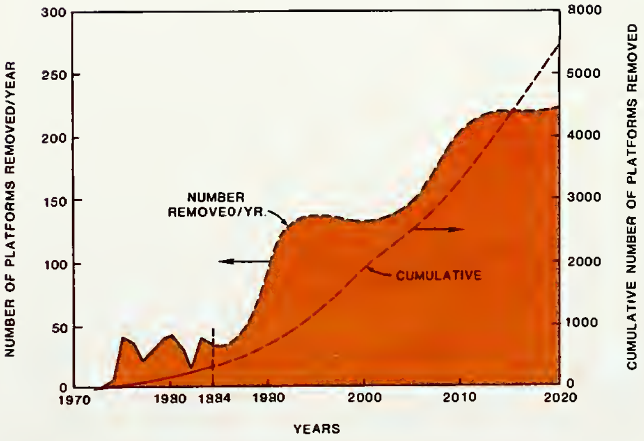
Steel weight: 33 tons
Volume: 800 m$^3$

panese artificial reefs resemble rigs



Graph courtesy National Research Council

# Louisiana Loutre

**By Sara Ann Harris**
**Photography by Bill Ford**

***The son of a trapper from the coastal marsh of Terrebonne Parish, not infrequently Sevin would espy that expressive mug, which so readily captures our emotions, popping up out of the water amid vegetation.***

"OTTER? IN LOUISIANA!?" That was the response we got most often as we set out to photograph the slender mustelid. Actually, their surprise might be expected since anyone who has ever attempted to research the furbearer, track it, trap it, or just simply sight it, firstly describes otter as furtive. Solitary and secretive in its habits, otter often elude. The bright-eyed, semi-aquatic creature is highly mobile and biologists have concluded that exact population counts with any confidence are quite difficult to obtain.

But, indeed, in Louisiana there *are* otter. In fact, all sources, including those using sophisticated technology to track the sprite, concur that there are more otter per acre here than in any place else in North America and possibly the world. With the most acreage of wetlands in North America, the Louisiana coastal marsh provides otter its most favored habitat.

But this does not surprise Lee Roy Sevin. The son of a trapper from the coastal marsh of Terrebonne Parish, not infrequently Sevin would espy that expressive mug, which so readily captures our emotions, popping up out of the water amid vegetation. Working for a land management company for twenty years has only confirmed to him the otter's density in Louisiana. Although Sevin is not surprised, he *is* intrigued. In 1957, curious about "the otter's life that he keeps so secret," Sevin began farming the furbearer.

Since then, Lee Roy and Diane Sevin have run Bayou Otter Farms, purchasing live otters from trappers during open season, housing them for a short time and then shipping them to zoos.

An expanse of lush vegetation, an abundance of preferred foods and a sustained high water quality have supported a stable population of otter in Louisiana. But the river dweller, whose range covers all of North America and beyond, has not fared as well elsewhere and, in fact, was rare or near extinction in a number of Midwestern states. So, what started out as an outlet supplying animal dealers and zoos, burgeoned into a business servicing reintroduction projects (reestablishment of waning native species). And as an interest in otter developed, states with otherwise healthy populations shipped in Sevin's otter to restock in selected areas where they were no longer sighting the mustelid.

To catch a glimpse of an otter where the species is on the decline *would* be surprising. Game and fish commission biologists explain that habitat loss, primarily, and possibly the excesses of fur harvesters in the past have led to the demise of this curious creature in some areas. Channelization of waterways for economic purposes and water pollution caused by industrial and development interests in some states have diminished the otter's natural range.

The problem of the thinning population is exacerbated by the otter's relatively low reproductive rate. The animals breed only once a year deep in the wintertime and after impregnation the female carries the blastocysts (microscopic free-floating fertilized eggs) for some 10 months before "delayed implantation," a process peculiar to mustelids (mink, weasel, skunk, badgers and martens). Additionally, she only births one to three "pups."

Reintroduction of the otter was fueled by a separate yet not irrelevant conglomerate of events. Placed on Appendix II by the Convention on International Trade in Endangered Species (a worldwide organization which regulates the trade of animals whose numbers might be dwindling), the commerce of otter became closely monitored in the mid-70's. In yet another arena, the growing popular demand for fur boosted the fur industry and escalated the price of pelts. In Louisiana, for example, which then as now ranked number one in this country's fur industry, the otter pelt (commanding the highest individual price for coastal furbearers) was at a record high of $45. These developments precipitated a general interest in otter and set in motion a wave of research across the country. As reported by the International Association of Fish and Wildlife Agencies in 1978, twenty-two

**Even caged, otters retain inquisitive nature**

**Sevin has special rapport with otters**

state agencies and five Canadian provinces began probing unknowns such as population characteristics and ecology of the Neartic river otter (Lutra canadensis) in order to answer the need for more biological information on the species.

As the leading state in otter production and trade, early on Louisiana assumed a major role in the rush of enthusiasm over the furbearer. Louisiana Department of Wildlife and Fisheries Fur and Refuge Division biologists spearheaded studies and monitoring projects the results of which are answering questions raised by conservationists, anti-trappers and trappers alike. From 1975 until the present, Louisiana has compiled extensive data about this hard to document furbearer on such relevant topics as reproduction, population density, habitat preference and movement, upland habitat quality and harvest distribution.

It was only natural that when a need for otters arose, Louisiana was considered. So, after 21 years in the business of otter farming south of Houma, in 1978 Lee Roy and Diane Sevin were sought out as *the* otter source. Whereas, they customarily handled an average of 30 animals each year, last season they housed and fed nearly 100 of the sleek, web-footed water lovers, which were then picked up by fish and game commissions for reintroduction in the Midwest.

Selected trappers collect the animals for the Sevins using modified leghold traps which cause the least stress and injury to the captive (rarely breaking the skin). Trappers receive more than double the amount for the animals live than what they would get for the valuable otter pelts. Sevin's stock shed—a sturdy, clean, cypress structure overlooking the bayou on several acres behind his house—is home to the transplants. Three spacious 50-foot aisles are lined on either side with sizeable individual cages specially designed for the escape artists.

Every inch of the property is fenced to protect the otter from exposure to distemper often carried by stray dogs and cats. Carefully scheduled inoculations strengthen the otters' immune systems to further fend off the disease. In a separate workshop and feedroom, Sevin uses a meat grinder and a concrete mixer to concoct a special blend of cod liver oil, eggs, carrots, Mink Chow (a mixture marketed for mink), liver and whole gutted nutria. When it comes to otter experts, the proof is in the pudding. Very sensitive to changes in diet while in captivity, the otters are highly susceptible to dysentery, constipation and botulism. Emil Liers, who chose otter as his life's work and is the only person to ever successfully breed otter in captivity on a large scale, purchased a number of animals from Sevin in the '70s and was highly complimentary of their health and appearance, which, of course, was directly related to the feeding and care they received in Louisiana.

Over 25 years, Diane and Lee Roy have seen 60 pregnant females through birthing. The Sevins designed nesting boxes which allowed them freedom to check on the pups independent of the female and very simply return them for mothering. Their success ratio is higher than anyone else's who has attempted this delicate process in captivity. In a cluster of banana trees at Point au Chene, Diane came upon a pregnant female who was to have problems during birthing. Diane promised herself that if she "saw the pup through, (she) would never take money for it." Boog-a-lee is now four years old and weighs close to 20 pounds–sizeable for even this largest of the coastal furbearers. He readily fashions his silky, deep brown pelage for any onlookers. Uncharacteristically ornery now, he is in season. Male and female otters both mature at about two years old and become decidedly snippy when they are ready to breed. Minnie, who was deserted by her mother and also raised at Bayou Otter Farms, is diminutive in size but not the least bit shy about initiating the mating process. When they were released in the bayou, she took to furiously biting Boog-a-lee about the head and wrestling with him.

Telling the story of his beginnings in the business when a St. Louis Zoo curator in need of an otter approached him with a $100 offer, Sevin explains he made his first sale and immediately placed an advertisement in a land management magazine. He hasn't had to rely on advertising since, and today he deals with fish and game commissions in Iowa, Arizona, Missouri, Colorado, Oklahoma, Kentucky and Tennessee. Also, it's not uncommon for him to get a call from an individual in Alabama or Florida, for instance, who has found a pup and wants advice on diet and care. He has shipped otter as far away as Canada, England, Japan and Australia.

Abroad, there is concern over a scarcity of otter, as evidenced by the otter symposium which the Sevins attended in Strasbourg, France, sponsored by the International Union for Conservation of Nature and Natural Resources. The conference represents the beginning of an international effort to protect otters from extinction, improve otter habitat and further research on the mustelid.

As predators at the top of their food chain living on a diet (in Louisiana) of fish, crawfish and crabs, otters naturally man an important post in the balance of their ecosystem. Additionally, because they ingest many aquatic organisms and mostly live in the water themselves, they are natural barometers of their environment. An otter's health closely reflects the condition of its ecosystem. Recent research indicates that certain pollutant levels in Louisiana otter are lower than those in otter of other regions of the country. Not insignificantly, this speaks for the quality of water in Louisiana.

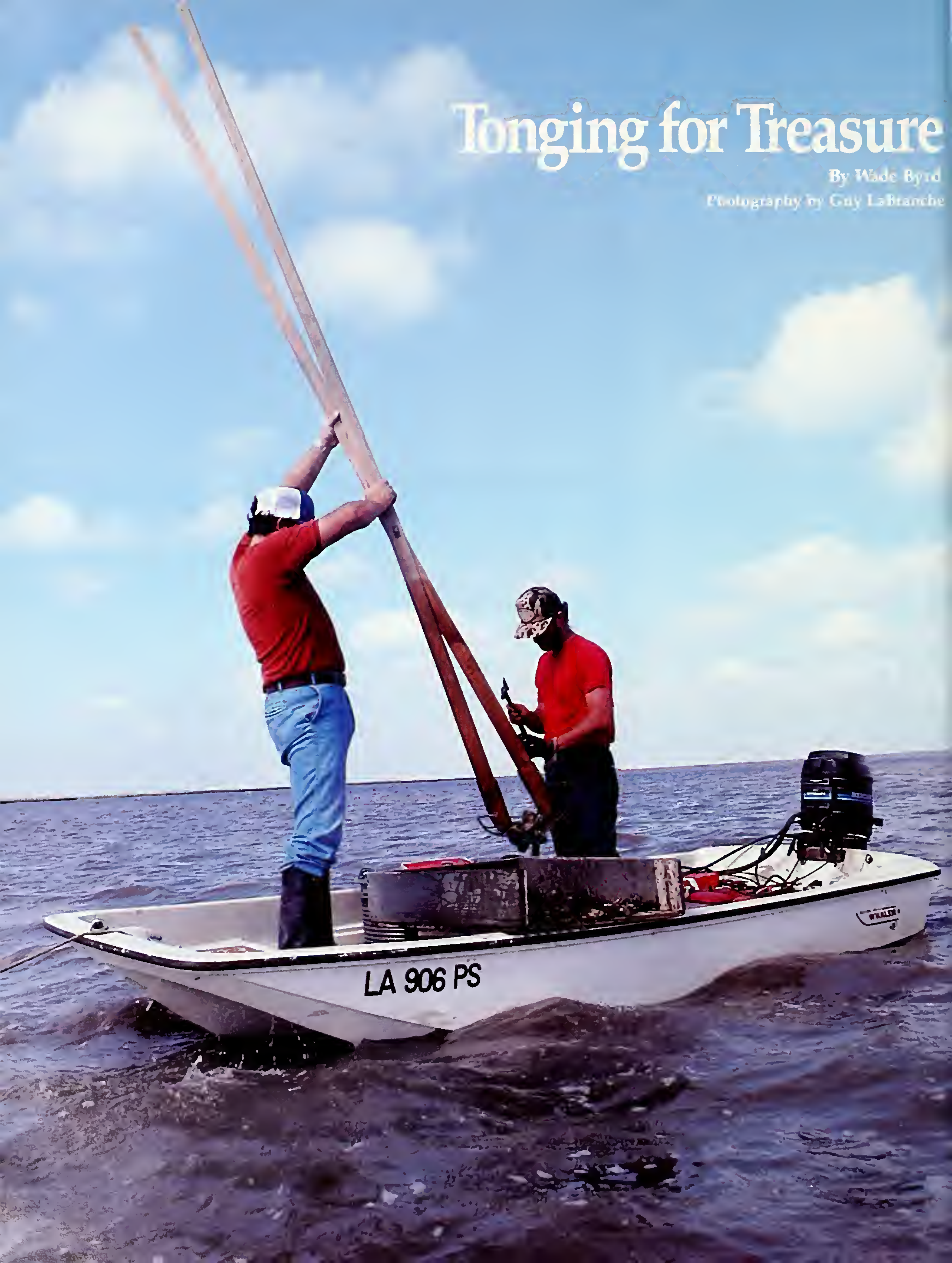
The appreciation of the otter's thick, silky fur as a valuable commodity has a history in itself. Iberville, also the son of a trapper, was commissioned by France to explore the Gulf Coast for its renowned furbearers and, impressed by the abundance of otter in Louisiana, he so named our waterways, such as Pass-a-Loutre and Bayou Loutre, for the esprit.

With an inquisitive look, the expert gracefully swam by belly up, seemingly taking it all in. After outings to varied locations where landowners and crawfish farmers claimed to have seen the playful Cajun critter swish by or slip down a chute, we finally had the photogenic pup in our viewfinder. We now include ourselves as honorable members in a group which we hope will be growing in numbers as the resurgence of the northern river otter gains.

# Tonging for Treasure

By Wade Byrd

Photography by Guy LaBranche



*Once you've found the oysters the real fun begins. Oyster tongs are like a giant pair of pliers with a basket at the end and using them effectively requires a little practice.*

I SEEM TO BE ONE of those unfortunate individuals who is constantly either a day too late or too early. I've seen so many too-good-to-be-true invitations turn out to be just that, untrue, that I once had a tee-shirt printed that read, "I know, I should have been here yesterday."

I've wasted literally cases of shotgun shells blazing away at high flying missles purported to be ducks or doves or some other such nonsense, spent uncounted nauseating eternities out on the hot relentlessly rolling Gulf practicing pulling up empty weights from 200 feet below, and spent so many cold lonesome days sitting up in trees waiting for that "phantom stag" that I have at times been tempted to start spelling my last name with an "i" instead of a "y."

All these experiences started with the same phrase, "Come on over Wade, the ______(redfish, doves, etc...) are really ________(tearing it up, as thick as flies, etc...).

These past experiences explain my somewhat subdued attitude about a standing invitation to "come on over to Calcasieu Lake and scoop up a couple sacks of oysters." Now if there's one thing that gets this Louisiana boy's taste buds drooling, it's oysters. To suffer the shame and humiliation of a luckless day in the "perfect" duck blind, that's one thing, but to have your hopes of a couple sacks of fresh, succulent oysters built up and then to have the rug pulled out from under you, that's almost unbearable.

Well, as luck, and the spirits that heckle fools like me, would have it, I suddenly found myself in the Calcasieu Lake area on an unseasonably warm February day with a total absence of anything else constructive to do.

Hunting season was over, much to the chagrin of my friendly shotgun shell supplier who regularly counts on me to pay his kids' orthodontist bill, and a confrontation with a pesky cork-eating alligator was the only thing I had to show for an afternoon spent fishing for reds in the marsh. The only thing, that is, except for my first sunburn of the season.

But alas, hope springs eternal. And, besides, if there's one animal that should be hard for even me to miss, it looks as if it should be an oyster. After all, it's not like they're going anywhere in a big hurry. I reassured myself with the knowledge that except for a very brief time early in the life of an oyster embryo when they go flitting about beating their tiny little cilia, they don't do a whole bunch of moving. In fact, the only thing more sessile than an oyster is a rock.

So I took the plunge and made a few calls and the next thing you know I was committed. I was to meet two oyster tongers extraordinaire the next morning at the ferry landing just west of Cameron below Calcasieu Lake.

Oysters are curious creatures. What else do you know that spends its life sucking seawater, changing sexes

A good heavy rubber glove is an absolute must when handling oysters and removing extraneous material and building a rock around itself. But, as I believe I've mentioned before, they sure are good.

It was a restless night as all I knew of oyster biology went out the window and I dreamt of sleek, jet-propelled bivalves grinning with their little shells as only an oyster can do and sticking their tentacles out at me as they rocketed off out of reach of my slow, plodding tongs.

Daylight brought relief from my fiendish nightmares and as photographer Guy LaBranche and I pulled up to the landing my optimism was fueled by the sight of a couple of confident and competent looking fellows there to meet us. I was right on both counts, as the two turned out to be marine biologist Jerry Ferguson and wildlife specialist James Martin. Those two guys have plucked more oysters out of Calcasieu Lake than Carter has pills.

Calcasieu Lake is a uniquely Louisiana gem. Located just downstream from the major urban and industrial area of Lake Charles, it is very sensitive to changing water conditions which can sometimes lead to closure of certain parts of the lake to oyster harvesting. Historically, the east side of the lake has been much more susceptible to water quality related closures, as is the case this year, while the West Cove area has more or less consistently maintained good water quality and sustained oyster harvests. Nevertheless, Calcasieu Lake produces an astounding volume of some of the highest quality oysters found anywhere in the country.

Oyster fishing in the lake is restricted to tonging only and is limited to the daylight hours. Recreational fishermen taking oysters for home consumption are limited to two sacks per boat per day and oysters must be sacked before leaving the fishing areas and culls (oysters under the three-inch minimum) must be returned to the water.

The oyster tonging season in Calcasieu Lake traditionally runs from mid November to mid March, this year beginning on November 11 and extending to sunset on Saturday, March 29.

I quickly learned that there are two ways to locate oyster beds. You can look for other oyster tongers or you can simply motor around the area and wait for the sound of your prop disintegrating to clue you to the fact that you are over a shell bed. Some not so adventuresome folks may, however, resort to a more conventional method of probing with a long pole to find shell beds.

Once you've found the oysters the *real* fun begins. Oyster tongs are like a giant pair of pliers with a basket at the end and using them effectively requires a little practice. It is a bit embarrassing to struggle, struggle, struggle and pull up a near empty basket when with much less effort your teacher is retrieving basketsful. The secret is that brute force is not the answer to successfully closing the jaws around a full load.

What you bring up from the bottom is an assorted mixture of oysters, shells, clams and other debris. A small hatchet or specially made hammer is then used to separate the oysters so the extraneous material can b returned to the water to serve as hard substrate for another crop. Within three days after fertilization, the young free floating oyster embryo begins to develop a pair of tiny shells and unless it can quickly find a hard, clean surface on which to attach, it falls in the bottom mud and is smothered.

About an hour and two sacks of oysters later, I was a convert. At last, I finally "got my limit."

## RED SPOTTED PURPLE

*(Basilarchia arthemis astyanax)*

**Size:** Wingspan–$2\frac{3}{4}$ to $3\frac{3}{4}$ in. (7 to 9.6 cm).

**Habitat:** Open woodlands, forest edges, meadows, water courses, coastal plains, shorelines, and roads and paths. Arroyos and canyons in the Southwest.

**Range/Status:** East of the Rockies south to central Florida. Also in Arizona and New Mexico.

**Food:** Adults feed on nectar, but also relish carrion, dung, and rotting fruit. Caterpillars eat the leaves of poplars, aspens, wild cherries, and willows.

**Did you know?** The harmless Red Spotted Purple resembles and mimics the behavior of the poisonous Pipeline Swallowtail butterfly.

## WOOD DUCK

*(Aix sponsa)*

**Size:** Bill to tail–17 to $20\frac{1}{2}$ in. (43 to 52 cm).

**Habitat:** Wooded swamps, rivers, lakes, and ponds.

**Range/Status:** Nests in portions of southern Canada and in the United States along the West Coast and throughout the East. Winters in southern half of breeding range.

**Food:** On land, it feeds on wild grapes and berries, acorns, chestnuts, beechnuts, grasshoppers, crickets and spiders. On the water, it eats insects, small fish, frogs, tadpoles, snails, and water plants.

**Did you know?** A female wood duck will generally return each year to the same tree cavity to lay her eggs and hatch her ducklings.

## GREEN ANOLE

*(Anolis carolinensis carolinensis)*

**Size:** Length–5 to 8 in. (12.7 to 20.3 cm).

**Habitat:** Fence posts, walls, tree trunks, shrubs, vines, tall grasses, and palm fronds.

**Range/Status:** Extreme southeast Virginia through Key West, Florida, extending west to southeast Oklahoma and central Texas.

**Food:** Eats cockroaches, crickets, flies, beetles, moths, other insects, and spiders. Hunts by day, using keen senses, quick reflexes, and ability to climb and crawl. Licks water from plants.

**Did you know?** An anole uses its tail to keep its balance when running and climbing, to store fat for use during hibernation, and to distract predators by shedding it when attacked

## OPOSSUM

*(Didelphis virginiana)*

**Size:** Head and body–$12\frac{3}{4}$ to $19\frac{3}{4}$ in. (32.5 to 50 cm); Tail–10 to 21 in. (25.5 to 53.5 cm); Weight–up to 12 lb. (5.5 kg).

**Habitat:** Moist woods, edges of streams or swamps, farms, cities, and suburbs.

**Range/Status:** Most of eastern United States except Maine, north Michigan, and north Minnesota, and extending southwest through Texas. Also in southeast Arizona, and on west coast from south British Columbia to California.

**Food:** Feeds at night on a variety of food, including nuts, meats, eggs, insects, carrion, and garbage.

**Did you know?** The opossum is the only marsupial, or pouched animal, in the United States.

## HONEY BEE

*(Apis mellifera)*

**Size:** Length–$\frac{3}{8}$ to $\frac{3}{4}$ in. (1 to 2 cm).

**Habitat:** Meadows, open woods, gardens, fruit orchards, and croplands where flowering plants grow.

**Range/Status:** Widely distributed throughout the United States.

**Food:** Bees eat nectar, pollen and honey. A bee carries nectar to the hive in a special section of its stomach and carries pollen in "baskets" on its hind legs.

**Did you know?** To make one tablespoon of honey, a bee must gather nectar from as many as 2,000 flowers.

## PEREGRINE FALCON

*(Falco peregrinus)*

**Size:** Bill to tail–15 to 21 in. (38 to 53 cm); Wingspan–38 to 46 in. (96.5 to 117 cm).

**Habitat:** Prairies, mountains, beaches, wide meadows, along rivers and lakeshores, and in some urban areas.

**Range/Status:** Sparse populations throughout the United States. The use of DDT drastically reduced peregrine populations from the 1940's to the 1970's. Reintroduced to portions of former habitat, including some cities, in 1970's. Endangered in all states.

**Food:** Eats pigeons, songbirds, ducks, shore birds, and gulls.

**Did you now?** Peregrines nest on rocky ledges, bridges, and tall buildings, using little, if any, nesting material to protect their two to four eggs.

## WOODHOUSE'S TOAD

*(Bufo woodhousei woodhousei)*

**Size:** Length–2 to 5 in. (5.2 to 12.7 cm).

**Habitat:** Grasslands, sagebrush flats, woods, marshes, desert streams, irrigated farmland, floodplains, and even urban and suburban backyards.

**Range/Status:** North Dakota and Montana south to central Texas and New Mexico; west of the Rockies from south Idaho to central Arizona.

**Food:** Feeds mostly at night, and can be seen catching bugs, beetles, flies, and mosquitos beneath lights.

**Did you know?** When a toad is threatened, its skin oozes a liquid. Though the liquid will not give you warts, it will burn the mouth of an animal that tries to bite a toad.

## EASTERN GRAY SQUIRREL

*(Sciurus carolinensis)*

**Size:** Head and body–8 to 10 in. (20 to 25 cm); Tail–$7\frac{3}{4}$ to 10 in. (20 to 25 cm); Weight–$\frac{3}{4}$ to $1\frac{3}{5}$ lb. (340 to 726 g).

**Habitat:** Hardwood or mixed forests, and urban and suburban gardens and parks.

**Range/Status:** Eastern half of the United States, and southeastern Canada. Introduced to Seattle, Washington, and Vancouver, British Columbia.

**Food:** Eats almost anything that grows on trees including buds, leaves, flowers, seeds, nuts, and cambium layer beneath bark. Also eats mushrooms, berries, and other fruit.

**Did you know?** Squirrels can sniff out buried nuts in up to one foot of snow

*Designed by:* Scott Bowen *Written by:* Gen Martin

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*National Wildlife Week • March 16-22, 1986*
*50 Years Working For Conservation 1936-1986*
*Join And Support The National Wildlife Federation And State Affiliates*

## TIGER BEETLE

*(order–Coleoptera; family–Cicindelidae)*

**Size:** Length–⅜ to ¾ in. (1 to 2 cm).

**Habitat:** Sunny, open areas such as sandy beaches and dry dirt roads or paths.

**Range/Status:** Widely distributed in the United States.

**Food:** Adults feed on ants, bugs, caterpillars, flies, worms, and aphids. The young live in tunnels in the ground where they grab passing insects.

**Did you know?** A tiger beetle usually seizes an insect with its mouth and then kills the prey by banging it against the ground. It then sucks out the juices and chews parts of the body shell.

## BLACKBURNIAN WARBLER

*(Dendroica fusca)*

**Size:** Bill to tail–4½ to 5½ in. (11.5 to 14 cm).

**Habitat:** Usually found in mixed coniferous forests. Where conifers are scarce, has adapted to deciduous forests.

**Range/Status:** Nests in southern Canada, northeastern United States, and south in mountains to north Georgia. Winters chiefly in northwestern South America.

**Food:** Moves from limb to limb looking for beetles, caterpillars, ants and grubs.

**Did you know?** The female Blackburnian warbler looks so different than the male that for a while it was thought to be a different species and was called the "Hemlock warbler."

## TIMBER RATTLESNAKE

*(Crotalus horridus)*

**Size:** Length–35 to 74½ in. (88.9 to 189.2 cm).

**Habitat:** Woods with rock outcrops in the North; swamps, canebrakes, and floodplains in the South, where it is known as the Canebrake Rattlesnake.

**Range/Status:** Extreme southwest Maine to north Florida, westward to central Texas, and north to southeast Minnesota.

**Food:** Often seen coiled motionless, waiting for the approach of mice, chipmunks, small birds, and squirrels. Active in daytime during spring and fall and at night during summer.

**Did you know?** Every time a rattlesnake sheds its skin, a new rattle segment is added to its tail.

## GRAY WOLF

*(Canis lupus)*

**Size:** Head and body–40 to 58 in. (100 to 150 cm); Tail–12 to 19 in. (30 to 48); Weight–70 to 175 lbs. (31.5 to 80 kg).

**Habitat:** Currently most abundant in wilderness forests and open tundra.

**Range/Status:** Common in Alaska and parts of Canada. Small, stable populations live in north Minnesota and on Lake Superior's Isle Royale. Threatened in Minnesota.

**Food:** Eats mostly mammals. Hunts in packs, usually at night. Kills some big game (deer, caribou, moose), but generally takes young, weak, or sick animals.

**Did you know?** Wolves communicate through various whines, yelps, growls and barks.

## PRAYING MANTIS

*(order–Orthoptera; family–Mantidae)*

**Size:** Length–2 to 4 in. (5 to 10.2 cm).

**Habitat:** Gardens, meadows, and fields.

**Range/Status:** Widely distributed throughout the United States.

**Food:** Food includes beetles, aphids, flies, leafhoppers, and caterpillars. To hunt, a mantis perches motionless among leaves and twigs, waiting for an insect to come within its grasp. It drinks from dew drops on plants.

**Did you know?** The praying mantis is the only insect that can turn its head sideways.

## BROAD-BILLED HUMMINGBIRD

*(Cynanthus latirostris)*

**Size:** Bill to tail–3¼ to 4 in. (8.2 to 10 cm); Wingspan–4 to 4⅜ in. (10 to 11 cm).

**Habitat:** In the United States, lives in desert canyons: along rocky slopes, margins of streams and springs, and in thickets of agave, mesquite, and other desert plants.

**Range/Status:** Breeds in south Arizona, southwest New Mexico, west Texas, and Mexico. Winters in Mexico.

**Food:** Probes for nectar and small insects in flowers.

**Did you know?** This hummingbird has a fascinating courtship dance. The male flies rapidly in front of the female, swinging back and forth like a pendulum and making a high-pitched *zing* sound.

## ORNATE BOX TURTLE

*(Terrapene ornata ornata)*

**Size:** Length–4 to 5¾ in. (10.2 to 14.6 cm).

**Habitat:** Primarily plains, open prairies, and dry sandy terrain.

**Range/Status:** Southern South Dakota, Iowa, and Wisconsin, south to Louisiana, Texas, and northern Mexico; west to eastern Colorado and New Mexico. Automobiles, pesticides, and loss of habitat have caused population declines.

**Food:** Eats chiefly insects such as grasshoppers and beetles, including those found in cattle dung.

**Did you know?** The markings of the ornate box turtle are excellent camouflage. A box turtle that is not moving may be almost impossible to see.

## MULE DEER

*(Odocoileus hemionus)*

**Size:** Head and body–33½ to 82½ in. (85 to 210 cm); Antler spread–up to 48 in. (121 cm); Weight–48 to 455 lbs. (22 to 215 kg).

**Habitat:** Forest edges, mountains, grasslands, foothills, chaparral, and desert.

**Range/Status:** Western Canada south through western United States, east to Minnesota and west Texas, and northern Mexico.

**Food:** Eats fresh grass and herbs when available, but usually depends on shrubs and twigs.

**Did you know?** A fawn is born without any deer scent that might attract predators.

# Fish or Cut Bait

**By Maurice Cockerham**
**Photography by Guy LaBranche and Bill Ford**

*The Department of Wildfife and Fisheries is facing a period of shrinking budgets, disappearing fish and game habitat, and rapidly increasing fishing and hunting pressure. Maintaining our current conservation effort will require an end to the free ride for unlicensed "users and takers."*

IN 1984, CONGRESS created what has become known as the Wallop-Breaux fund. That landmark legislation greatly enhances efforts to develop, improve and restore recreational boating and fishing opportunities throughout Louisiana's saltwater and freshwater areas.

Actually, Wallop-Breaux is an extension of the Dingell-Johnson Act, proposed and supported by recreational fishermen years ago as a means to finance sport fishing conservation work. Dingell-Johnson was another example of the readiness of sportsmen to pay their own way. It consists of a federal excise tax, paid at the manufacturer's level, on numerous items of sportfishing equipment. Each year, funds in the Dingell-Johnson account are allocated to the individual states. The amount each state receives depends partially upon the number of fishing licenses sold in the respective states.

The Wallop-Breaux legislation represents a critical updating and expansion of the Dingell-Johnson concept. Among other things, the new legislation recognizes that past efforts, financed by sportfishermen, have also been extremely valuable to recreational boaters, swimmers, water skiers, campers and other groups.

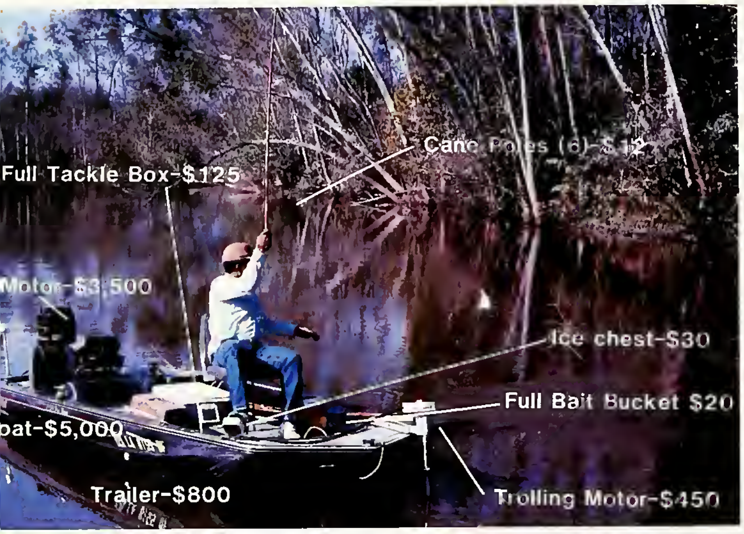
A vital part of the Wallop-Breaux program is the extension of the excise tax to a number of items of recreational boating equipment so that all boaters, rather than simply the sportfishermen, would contribute to the overall effort.

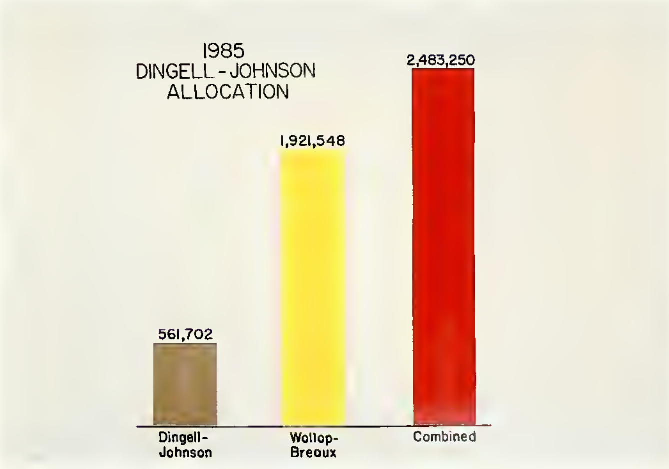
Another even more meaningful provision of the legislation is the dedication of the federal marine fuel tax receipts to the Wallop-Breaux fund. Previously, those tax receipts were shoveled directly into the federal general fund. Now they are earmarked for the benefit of those who pay them.

All of that brings us directly to the pressing need for some changes here in Louisiana. You see, before the Department of Wildlife and Fisheries can use Dingell-Johnson or Wallop-Breaux allocations, we have to come up with "matching funds." That means that, for every D-J or W-B dollar we receive we have to cough up a quarter for the particular project involved. No state money–no project.

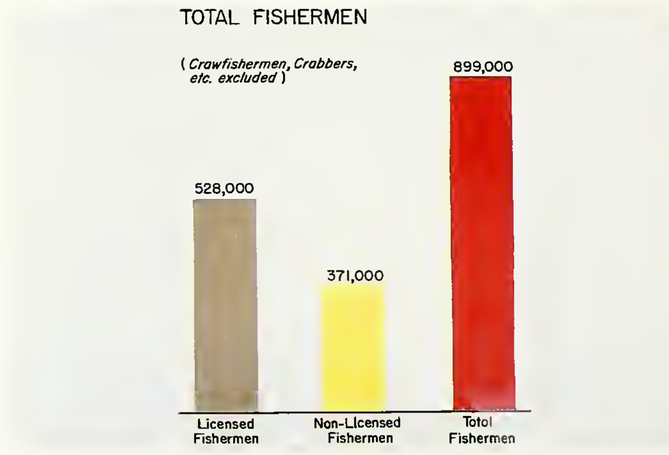
The seriousness of the matter becomes quite clear when one considers that the halcyon days of bountiful oil and gas revenues are fast becoming history and budgets are growing tighter each year. On top of all that comes Wallop-Breaux. Where Louisiana has been

This fisherman not now required to buy $2.50 license



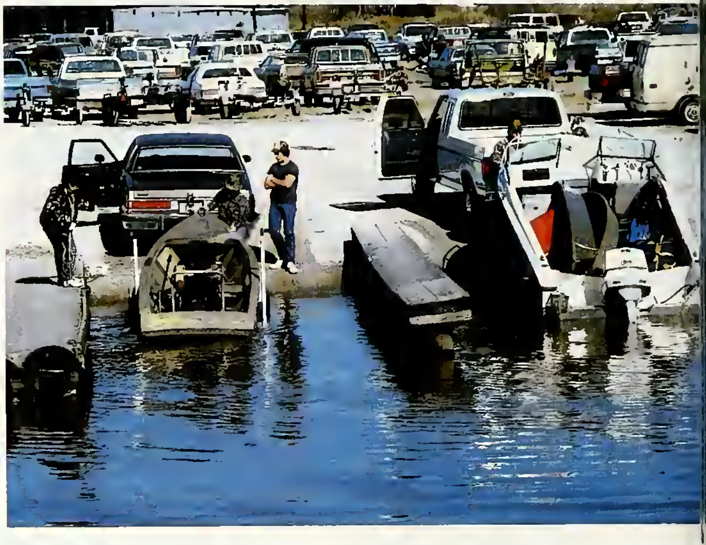


Louisiana D-J and Wallop-Breaux allocations



Licensed vs unlicensed fishermen in La.

Boat ramps and fish hatcheries are among projects funded with federal funds



receiving about half a million bucks a year in D-J money, we are now faced with the availability of an additional 1.9 MILLION in the current year's Wallop-Breaux fund. Where we have been expending about $125,000 yearly in state matching funds, we now need some $625,000 a year in order to fully utilize the available monies. Where will the additional money come from?

The simplest and fairest way to provide the additional funds is the enactment of a "Universal Fishing License." Simply put, that means doing away with the free ride that several hundred thousand Louisianans have been enjoying. It means "If you want to fish (enjoy the benefits of our widespread fisheries conservation program), you have to pay your share (buy what is currently the nation's cheapest fishing license)!

Under our present license requirements, only those fishermen using a rod and reel and/or artificial baits are required to buy fishing licenses. That exempts trot lines, jug fishing, recreational crab fishermen and crawfishermen, and the cane-pole-and-worm fishermen. (You just might be interested to know that several studies suggest that non-licensed cane polers actually harvest more fish (freshwater) than licensed rod and reel fishermen.)

At this point, just a few statistics are in order. In the 1983-84 license period, Louisiana issued just over 430,000 resident fishing licenses which translates into about $700,000 for the Department of Wildlife and Fisheries, or about 20 percent of the Fish Division's annual budget.

At the same time, a study by the U.S. Fish and Wildlife Service concluded that we have a total of about 900,000 fishermen, over the age of 16 years, in Louisiana. That means that less than half of the fishermen in this state are paying their share to enjoy the bounties of the state's renowned fisheries!

Present law also exempts trot lines, jug fishing and recreational crab and crawfish fishermen

Now, before the hurrah starts about who can and can't "afford" to buy a fishing license, let me point out once more that our $2.50 resident fishing license is the cheapest in the nation. We are talking about the cost of two packs of cigarettes...two gallons of gasoline...a six pack of cold drinks. As a matter of fact, we are talking about less than the cost of a cane pole bought at a roadside bait stand! The average cane pole fisherman probably spends more for gasoline on one trip to that special fishing hole than a license would cost for the entire year.

Then too, thousands of those cane pole fishermen show up on the waterways in outboard motorboats. They have more invested in red and white plastic bobbers than a fishing license would cost. They are simply users and takers and do not contribute anything to the preservation and enhancement of the sport they enjoy.

There is another, more insidious aspect of the license question. The Fish Division is only one part of the department, and draws its funds from the same coffers as the Game Division, the Fur and Refuge Division, and the Enforcement Division. Without the increased revenues from a Universal Fishing License, the efforts of those other divisions may be penalized in order to make up the necessary funds for the Fish Division.

It is certainly time for the "free rides" on Louisiana's famed fishing grounds to come to an end. The Universal Fishing License would hurt no one, and it would mean an additional $700,000 for conservation efforts... $700,000 that could very well represent more than two and a half million dollars in Dingell-Johnson and Wallop-Breaux funds.

It is time now for all those who enjoy the fabled bounty of Louisiana's waters to fish or cut bait.

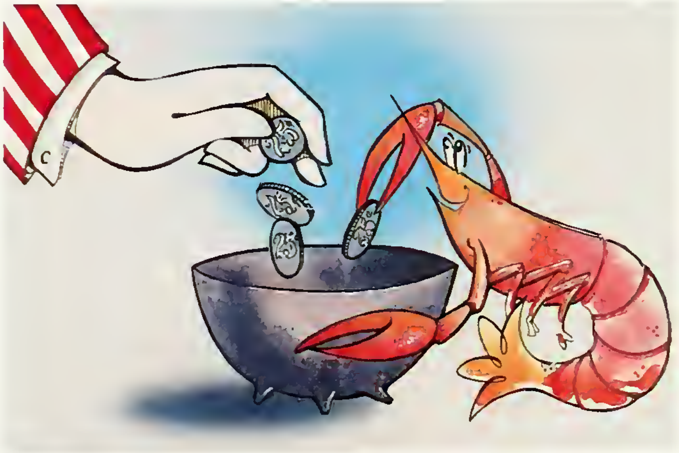
The cost of gasoline for one fishing trip probably exceeds cost of license

**LICENSE COST - SOUTHEAST UNITED STATES**

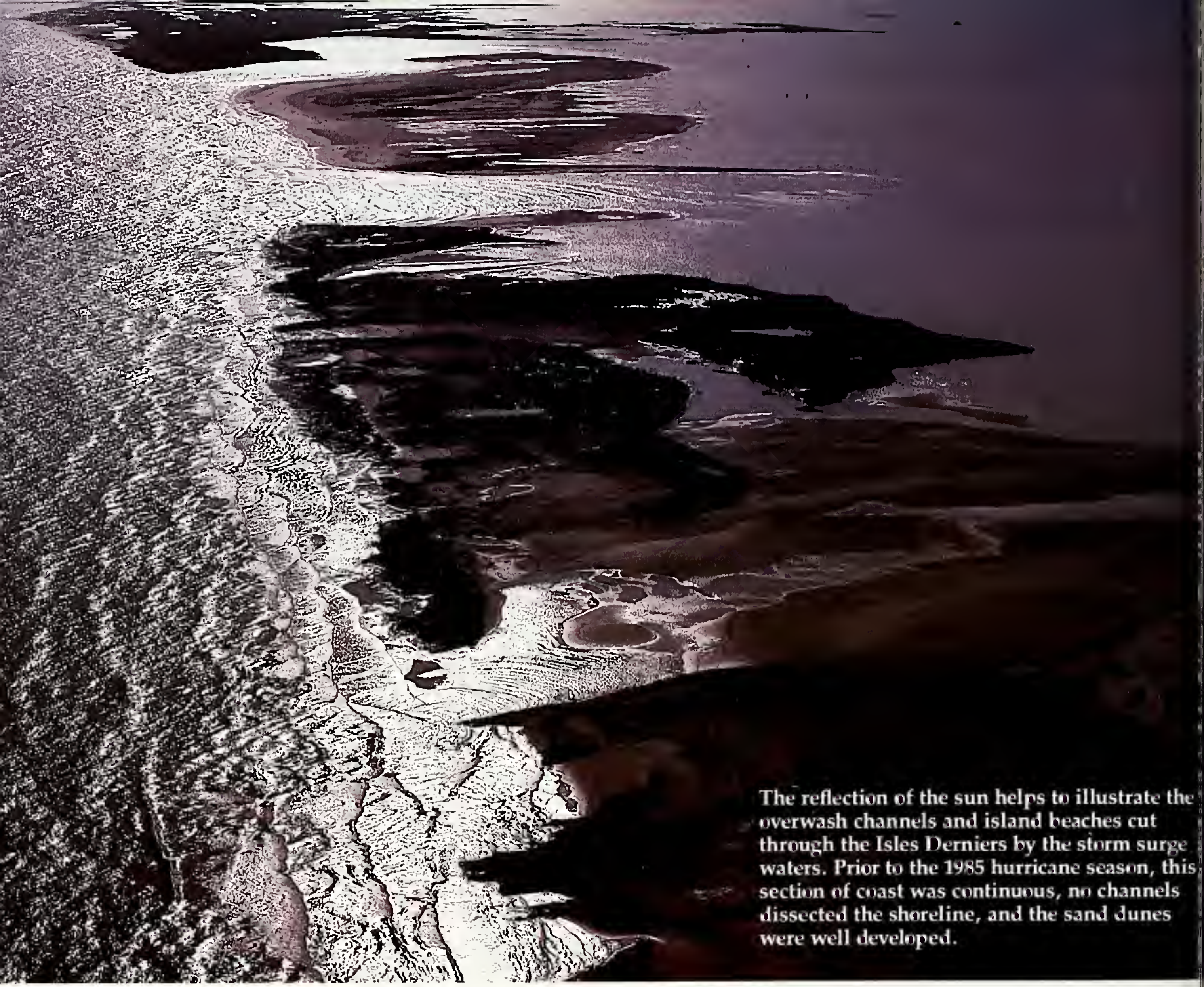
| | | | |
|---|---|---|---|
| Alabama | $6.25 | Missouri | $6.00 |
| Arkansas | $10.50 | North Carolina | $9.50 |
| Florida | $6.00 | Oklahoma | $7.50 |
| Georgia | $5.50 | South Carolina | $7.50 |
| Kentucky | $7.50 | Tennessee | $5.25 |
| Louisiana | $2.50 | Texas | $8.00 |
| Maryland | $8.00 | Virginia | $7.50 |
| Mississippi | $4.00 | West Virginia | $7.50 |

*Average License Cost $7.00*

Louisiana license cost lowest in area



Federal funds require state matching money



The reflection of the sun helps to illustrate the overwash channels and island beaches cut through the Isles Derniers by the storm surge waters. Prior to the 1985 hurricane season, this section of coast was continuous, no channels dissected the shoreline, and the sand dunes were well developed.

# Protecting Our Barrier Islands

**By Shea Penland, John Suter and Lindsay Nakashima**
*Louisiana Geological Survey*

***Louisiana's barrier islands serve as the first line of defense against the awesome destructive forces of hurricanes and tropical storms.***

UNPRECEDENTED IN recent history, Louisiana experienced three hurricanes during the 1985 hurricane season. Hurricanes Danny, Elena, and Juan have caused the most severe barrier island erosion problem in Louisiana since the landfalls of Hurricanes Camille (1969) and Betsy (1965). The Hurricane Impact Team (HIT Team) of the Louisiana Geological Survey in the Department of Natural Resources (DNR) responded and documented the impacts of these storms across coastal Louisiana.

With land loss rates in coastal Louisiana exceeding 50 square miles per year, preservation of the state's barrier shorelines has become critical The barrier islands serve as the first line of defense against hurricanes and tropical storms. Without these barriers, the full force of storm surges and hurricane waves will directly strike the fragile interior wetlands, resulting in even more rapid deterioration than what is currently occurring. In addition, loss of barrier islands will increase saltwater intrusion and accelerate the destruction of freshwater swamps and marshes at

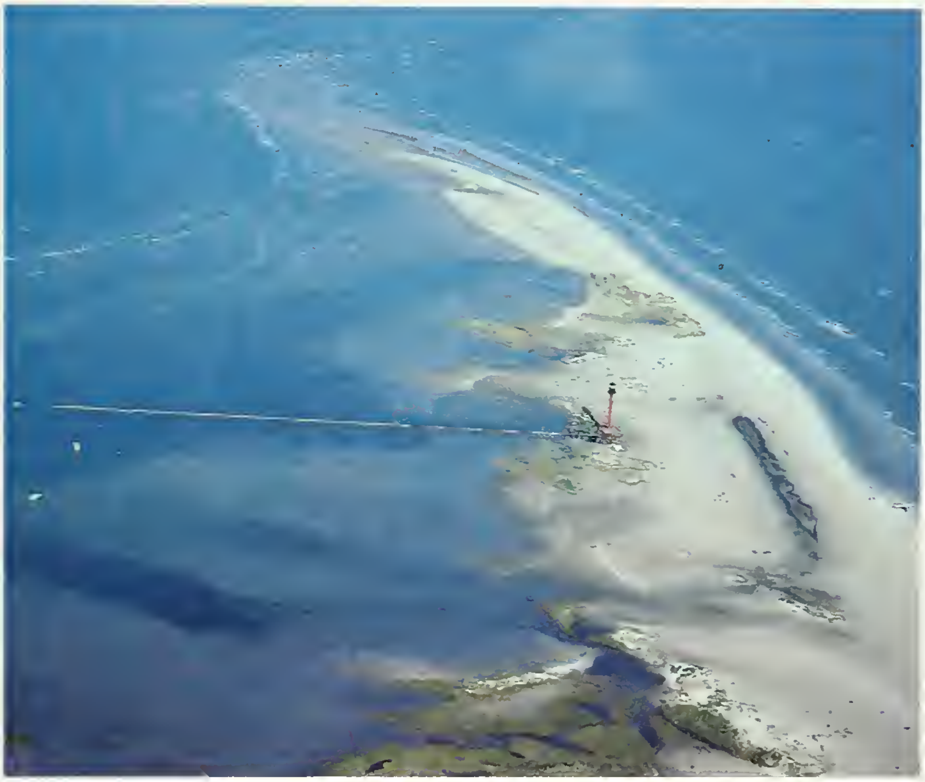
he upper ends of the state's estuar-
ne basins.

The direct impacts of Hurricanes
)anny, Elena, and Juan illustrate the
erious threat these storms pose to
oastal Louisiana. The serious prop-
rty damage caused by hurricanes
ıften diverts attention from cata-
trophic impacts on the state's natu-
al resources in the coastal zone.

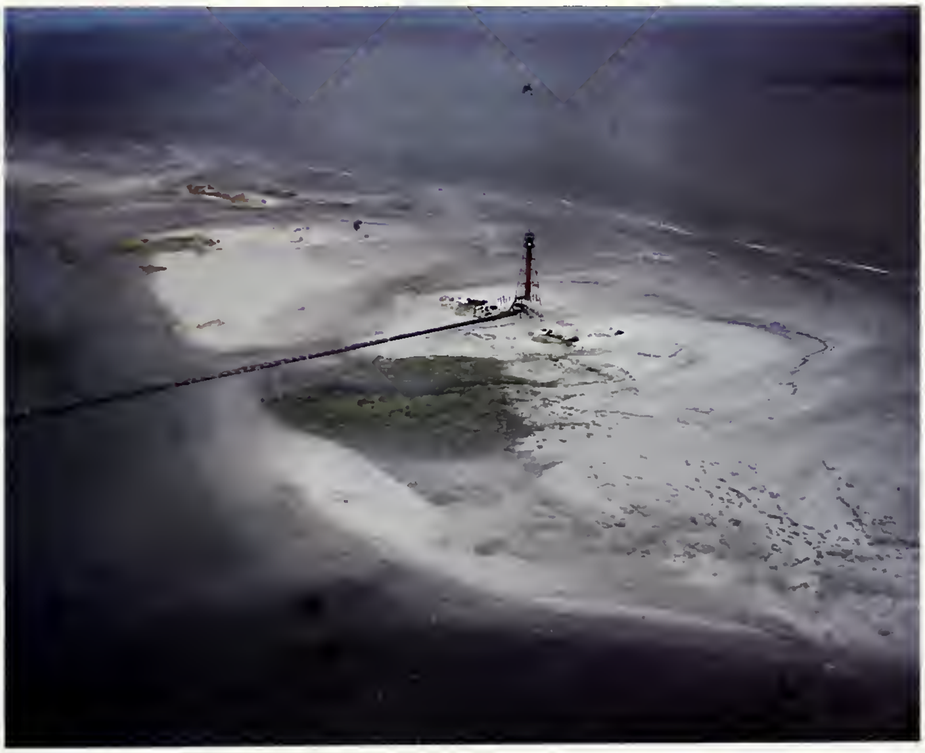
The Terrebonne Parish barrier
slands were the hardest hit by the
985 hurricanes. Since Hurricane Bob
n 1979, the Isles Dernieres had
ıeen in a recovery phase. Dune fields
vere developing, many parts of the
slands were becoming revegetated,
nd a large bird rookery had been
stablished on the western half of the
slands. Danny was the first hurri-
ane to directly impact this barrier is-
and arc since 1979. High wave
nergy and storm surges associated
vith the 1985 hurricanes eroded
bout 10 percent of the Isles Der-
ıieres land area, cut several breaches
hrough the islands, and destroyed
arge portions of mangrove swamp
hat served as a bird rookery. The
errebonne Parish Barrier Island
Restoration Project prevented breach-
ng in the eastern Isles Dernieres.
The design of this parish-funded
roject integrates sand nourishment
nd revegetation techniques. LGS
eologists reported that the post-
torm condition of this area demon-
trated the effectiveness of these
echniques.

Along the Bayou Lafourche barrier
slands, two major breaches were
ut through Timbalier Island at an oil
nd gas access canal, as well as
nother through the eastern end of
he island. Additionally, the eastern
nd of Timbalier Island was severely
roded. The East Timbalier Island
eawall was damaged in several
laces, and was unsuccessful in pre-
enting overwash and erosion of
his barrier island.

Further to the east at Grand Isle, a
lifferent pattern of shoreline change
ccurred. During Hurricanes Danny
nd Elena, the beaches of Grand
sle eroded in excess of 100 feet and
he hurricane protection levee was
lightly eroded. After Hurricane
uan, approximately 20 percent of the
urricane protection levee was de-
troyed. The levee was damaged at
he western end where a nearshore

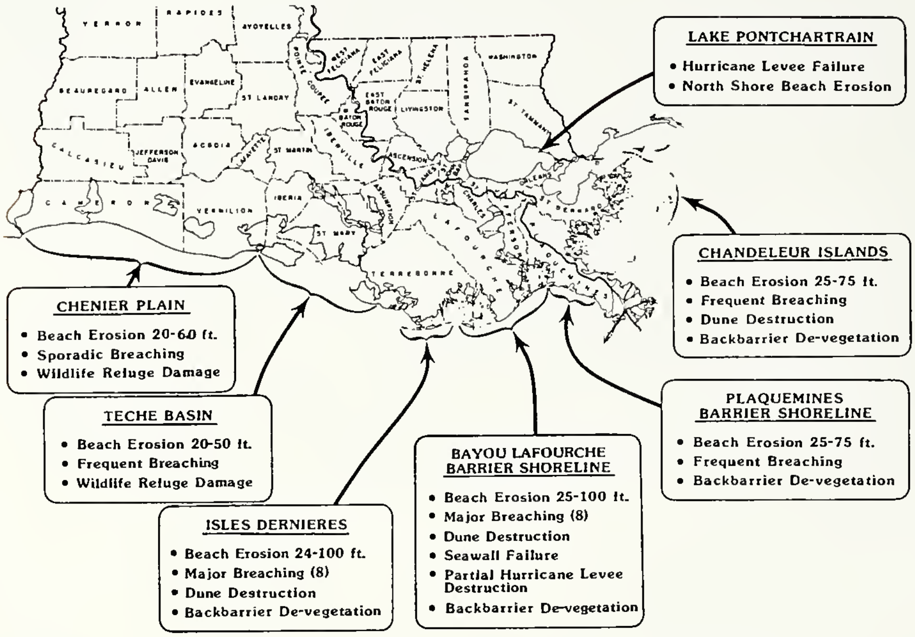


**An oblique aerial photograph illustrating the pre-Hurricane Elena shoreline along Hewes Point at the northern end of Chandeleur Islands in St. Bernard Parish.**



**An oblique aerial photograph illustrating the post-Hurricane Elena conditions along the same section of shoreline as shown in top photo. Use the lighthouse as a reference and rate the amount of beach erosion, landward barrier migration, and dune destruction.**

**Summary of the 1985 hurricane impact in coastal Louisiana as a result of Hurricanes Danny, Elena, and Juan.**



LAKE PONTCHARTRAIN
- Hurricane Levee Failure
- North Shore Beach Erosion

CHENIER PLAIN
- Beach Erosion 20-60 ft.
- Sporadic Breaching
- Wildlife Refuge Damage

CHANDELEUR ISLANDS
- Beach Erosion 25-75 ft.
- Frequent Breaching
- Dune Destruction
- Backbarrier De-vegetation

TECHE BASIN
- Beach Erosion 20-50 ft.
- Frequent Breaching
- Wildlife Refuge Damage

PLAQUEMINES BARRIER SHORELINE
- Beach Erosion 25-75 ft.
- Frequent Breaching
- Backbarrier De-vegetation

BAYOU LAFOURCHE BARRIER SHORELINE
- Beach Erosion 25-100 ft.
- Major Breaching (8)
- Dune Destruction
- Seawall Failure
- Partial Hurricane Levee Destruction
- Backbarrier De-vegetation

ISLES DERNIERES
- Beach Erosion 24-100 ft.
- Major Breaching (8)
- Dune Destruction
- Backbarrier De-vegetation

sand borrow site used for levee construction was dredged too close to Grand Isle's shoreline. This near-shore dredge site served to focus storm wave energy directly onshore, resulting in complete destruction of the levee in the immediate area. In spite of this erosion, the levee protected Grand Isle from direct hurricane overwash, preventing the island from being breached.

Surprisingly, after Hurricane Juan, Grand Isle beaches showed only minor erosion of less than 20 feet. On the central island, some beaches built out 20 to 40 feet. This can be only attributed to the presence of the hurricane protection levee and beach nourishment. The extensive erosion associated with Hurricanes Danny and Elena was related to a natural adjustment period following the initial levee and beach construction during which the beaches eroded and the fill material was dispersed until a new equilibrium beach profile was established. After this process, the Grand Isle project achieved a configuration that provided maximum beach erosion protection. The Grand Isle beaches experienced very little erosion compared to the earlier storm impacts and to the unprotected beaches immediately to the west at Fourchon and Elmers Island, which experienced erosion in excess of 50 feet during Hurricane Juan. Further east, towards Sandy Point, the shorelines were eroded 20-40 feet, and several large breaches were cut, related to pipeline and access canals dredged in the wetlands.

Hurricane Elena made landfall in eastern Louisiana, causing severe coastal erosion and land loss on the Chandeleur Islands. This entire island chain was overwashed and breached at many locations, and the storm removed approximately 10 percent of the total island area.

Strong offshore winds pushed wat across the Chandeleur Islands, cutting major channels in the north that graded to smaller, shallower channels in the south. On many parts of the Chandeleur Islands vegetation was removed and major dune fields severely damaged.

To respond to the problems of coastal erosion and land loss, the Louisiana Geological Survey has been charged with developing and administering a ten-year, two-phas Coastal Protection Master Plan.

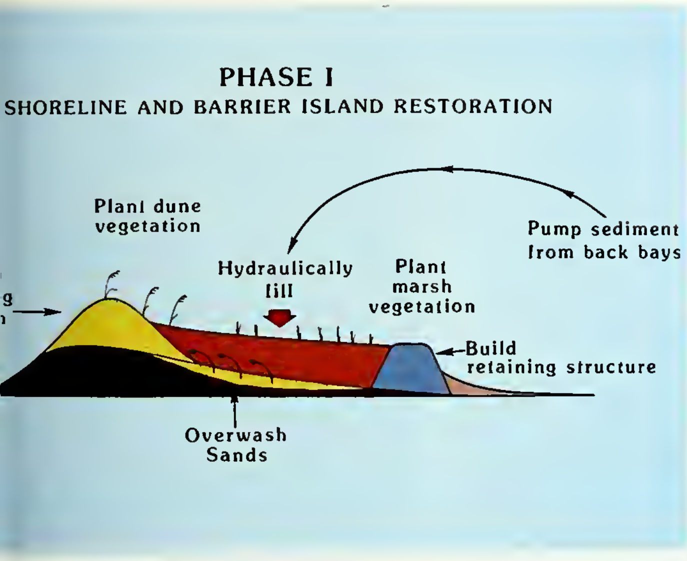
Phase I of the plan calls for imple mentation of barrier island and shoreline restoration projects. Thes projects are designed to slow erosi of barrier islands and mitigate the destruction by hurricanes. In developing the Coastal Protection Maste Plan, LGS geologists and engineers investigated a variety of coastal protection options. Results of these investigations indicated that the m cost-effective and proven methods for coastal protection are barrier island restoration and beach nouris ment techniques combined with revegetation–the techniques which were used in the project implement in the eastern Isles Dernieres by th Terrebonne Parish government and the U.S. Army Corps of Engineers Traditional coastal protection stru tures such as the seawall at East Timbalier Island have proven to be very expensive, ineffective in redu ing coastal erosion, and have in ma cases accelerated coastal erosion.

Restoration work will involve moving sands that have been wash to the back of the islands gulfward to reform the dune line. This will b accompanied by construction of la cellular retaining basins, which wi be filled with sediment dredged fr the backbarrier bays. Following settlement and adequate leaching the sand to remove salt, vegetation will be planted on both dunes and backbarrier deposits to help stabili the sediment. These restoration measures will raise the average barrier island elevation, rebuild ba barrier marshes, and reduce the kelihood of overwash and storm eaches.

During Phase II of the Coastal rotection Plan, offshore sand deposs located during Phase I will be sed to periodically nourish the arrier islands and beaches. The nds dredged from offshore will be umped to the barrier island shorene and used to enlarge the dunes nd extend the beachface seaward. egetation and sand fencing will be used to help stabilize the dune fields.

Hurricanes and winter storms are major contributors to the destruction of Louisiana barrier islands. The analyses of the impacts of Hurricanes Danny, Elena, and Juan have provided valuable information concerning how and where this destruction takes place.

The successful performance of the Terrebonne Parish Barrier Island Restoration Project and the U.S. Army Corps of Engineers' Grand Isle Hurricane Protection Levee and Beach Nourishment Project through three direct hurricane impacts in 1985 documents that the techniques of beach nourishment and revegetation utilized in the state's Coastal Protection Master Plan are cost-effective methods of restoring and protecting Louisiana's barrier islands.


PHASE I
SHORELINE AND BARRIER ISLAND RESTORATION
Plant dune vegetation
Pump sediment from back bays
Hydraulically fill
Plant marsh vegetation
g
n
Build retaining structure
Overwash Sands

iagram illustrates the construction technique used in hase I Barrier Island and Shoreline Restoration Design.

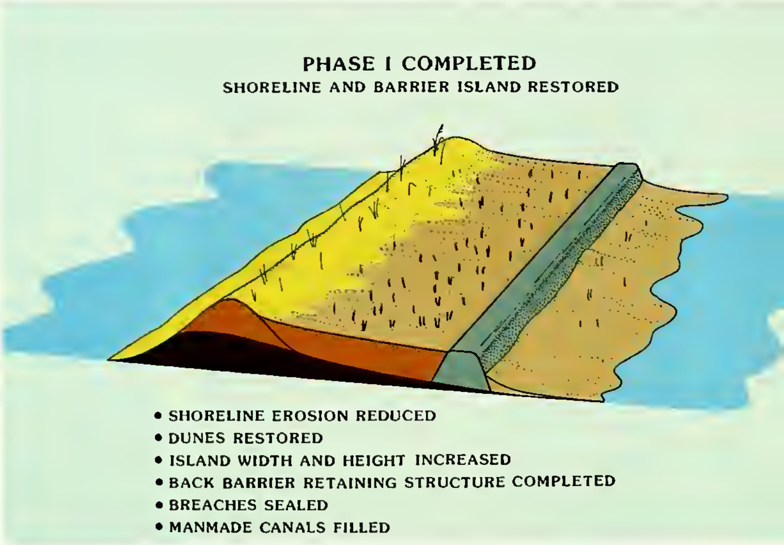
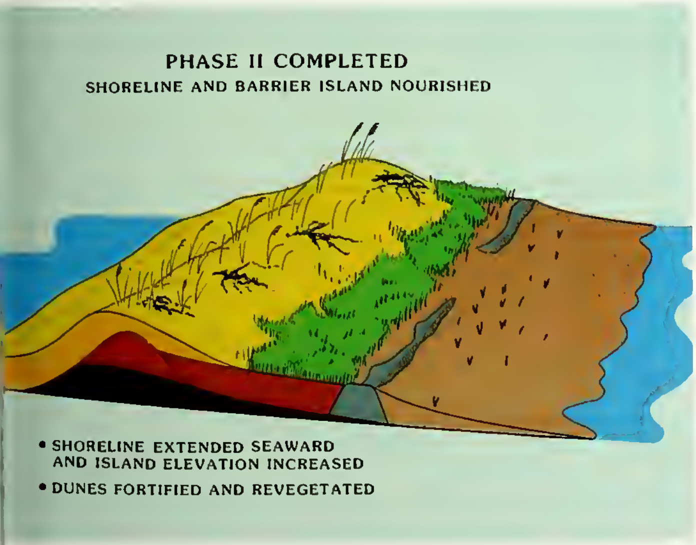

PHASE I COMPLETED
SHORELINE AND BARRIER ISLAND RESTORED
• SHORELINE EROSION REDUCED
• DUNES RESTORED
• ISLAND WIDTH AND HEIGHT INCREASED
• BACK BARRIER RETAINING STRUCTURE COMPLETED
• BREACHES SEALED
• MANMADE CANALS FILLED

Diagram illustrates an oblique view of a completed Phase I Barrier Island and Shoreline Restoration Design project.


PHASE II COMPLETED
SHORELINE AND BARRIER ISLAND NOURISHED
• SHORELINE EXTENDED SEAWARD AND ISLAND ELEVATION INCREASED
• DUNES FORTIFIED AND REVEGETATED

iagram illustrates an oblique view of a completed hase II Beach Nourishment Design project.

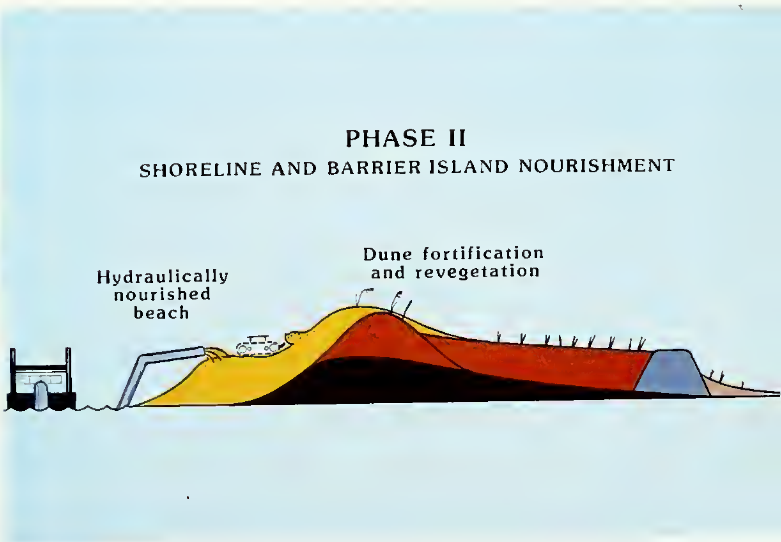

PHASE II
SHORELINE AND BARRIER ISLAND NOURISHMENT
Hydraulically nourished beach
Dune fortification and revegetation

Diagram illustrates the construction techniques used in Phase II Beach Nourishment Design.

By Sara Ann Harris
Photography by Bill Ford

# Matching Wits in the Wilds of Louisiana

*Protecting the outdoors from those who would exploit it is a job as diversified as the state's habitats.*

GREY MIST SHROUDED the piney hills of Catahoula as the sky lightened on this Thanksgiving dawn. Through a break in the trees down a brushy hollow, four riders stalked the grim woods. Outfitted in chaps, leathers and cowboy hats, with badges affixed to their breast pockets, the men could have been mistaken for a posse of the Old West.

And, in an odd way, the job of these enforcement agents, along with their 231 colleagues, of the Louisiana

Department of Wildlife and Fisheries *is* similar to that of the sheriffs of yesteryear. Their turf is the untamed and tangled areas of the state, which they often traverse alone, though usually in a four-wheel-drive or a power boat, constantly on the lookout for that character who, for personal profit or other reasons, has taken the law nto his own hands.

The horsemen riding over the holiday were out on special assignment. The outlaw, as the Division calls a violator of wildlife laws, has introduced a new wrinkle n what seems to be a never ending battle of wits between the pursuer and the pursued. After agents were issued four-wheel-drive vehicles, enabling them to ravel the most difficult and out-of-the-way dirt roads which cut through the best hunting territory and, unfortunately, that most often outlawed), outlaw deer hunters resorted to riding horses. Since deer are less easily spooked by the sight or smell of a horse than a human, they gained an obvious advantage. Plus, horses provide outlaws quick cross-country getaways.

So, enforcement agents Charles "Junior" Tarver of Concordia, Jim Jukes of Acadia, and E. C. Meyers of Catahoula mounted their own personal mares to match wits with the offenders. Glen McGuffe of Catahoula, Buddy Stutson of LaSalle and Todd Dugas of Jeff Davis joined forces with the team to flush out the offenders.

This isn't the first hunting season Enforcement has elied on the quadrupeds to track criminals. Over he past four years agents have made occasional rides working as plainclothes officers and have successfully aught offenders offguard by approaching them without giving away their own identities.

This special assignment demanded horsemanship plus the skills that good agents exercise daily. To sleuth he most well equipped predator in the wilds of Louisiana, besides learning every detail in the 400 plus wildlife egulations and every bend in the parish's country oads, an agent must be adept at reading a face conoured by years of experience in the backwoods. He must have a knack for second guessing a country boy who feels that because his daddy, and before that his granddaddy, hunted this parish, he has every right o take game where and when he pleases.

The better hunter an agent is—the better he knows he woods and waters and the wildlife they support—he better he can track those who threaten the natural balance in the communities of the deer, the otter, the white perch, the alligator, the oyster and other vulnerable creatures.

Every good hunter and every good law enforcement gent has honed his firearm skills to an art. And, lthough the situations where actual use of a weapon is alled for are limited, the enforcement agent has been rained to judge just which these are and follow through esponsibly.

But outsmarting the criminal and catching up with him is just half of the puzzle. Enforcing the law is only effective in the context of processing an arrest or "making a charge stick." So, while tracking a lawbreaker, the agent must think like an attorney. That is, he must understand the legal system well enough to be able to "build a case" in the field. Without hard facts and evidence to support a charge, the agent's argument won't hold up in court.

Consider attempting to build a case from these real life situations. It was 2 a.m., Christmas night, 16° and the winds were 35 m.p.h.—excellent cover for an outlaw. His strategy is to work when he assumes no one else will. But an agent on duty heard a shot and drove down off the levee toward the spotlight in a thicket. The sound of his approach was swallowed by the wind and he stepped up behind the "spotlighter" to question him. Pop's story went something like this: "We are coon hunting—my boy and I—he's off in the woods rounding up the dog." The agent stared at him squarely and stood his ground, figuring he would "freeze the boy out." But it didn't take too many more questions to discover that this motley duo lived only a half mile away and, more than likely, the boy had hidden his firearm, the clue to their real intentions, and was already headed home.

Case #2. An agent stopped a couple of "hunters" in the dead of a wintery night for questioning:

"Oh, yeah, we're hunting coon."

"You need a dog to hunt coon at night with a gun, gentlemen."

"We got us a dog," the man said and pulled a shivering Chihuahua out of his coat pocket.

The outlaw goes to great lengths to circumvent the laws which were written to protect hunters and preserve their sport. Obviously, agents do not simply don a uniform, strap on a pistol, shove a four-wheel-drive into gear and expect to take on the likes of these two "coon hunters." Before being assigned a tour of duty, they earn the Police Officers Standard of Training certification, as required by law of anyone having law enforcement powers and carrying a gun. At Wildlife Interrogation, trainees undergo three weeks of instruction in wildlife regulations and boating safety, which covers areas such as sport fishing, trawling, hunting big game, harvesting alligator, trapping furbearers, and hunting migratory birds.

Completion of Photoelectronic Intoximeter training qualifies the officers to administer alcohol breath tests as taught by the State Police Academy. Additionally, the trainees must be certified by the American Red Cross as proficient swimmers and graduates of courses in First Aid and Cardiopulmonary Resuscitation. Each incoming agent works a one week assignment with the Saltwater Enforcement Patrol to gain first hand experience with regulations that relate to offshore activities such as oyster leases and saltwater fishing.

But the test of an agent's skills, of course, comes when he steps out of the classroom and into the field. For no less than one year, the Division requires that the agent work as a trainee riding with an experienced partner until he demonstrates mastery enough of the job to merit working independently. The trainee's supervisor will recommend a promotion based on his capability.

The Enforcement Division is the largest in the department with 251 employees. Last fiscal year over 57,000 commercial licenses were sold, making each agent responsible for an average of 597. And over 1 million sports licenses went, which breaks down to 5,204 per agent. In terms of areas patrolled, averaging Louisiana's 50,820 square miles equals 246 per agent. Though these distributions vary somewhat from parish to parish, however it's calculated any one agent handles quite a workload.

Protecting the outdoors from those who would exploit it is a job as diversified as the state's habitats. An agent's day may include checking for out-of-state fishing licenses in the lakes of Sabine Parish, investigating a case of illegal sale of otter or coon in the marshes of Assumption, inspecting trawling nets offshore from Plaquemines, or stalking poachers in the hills of Catahoula on horseback.

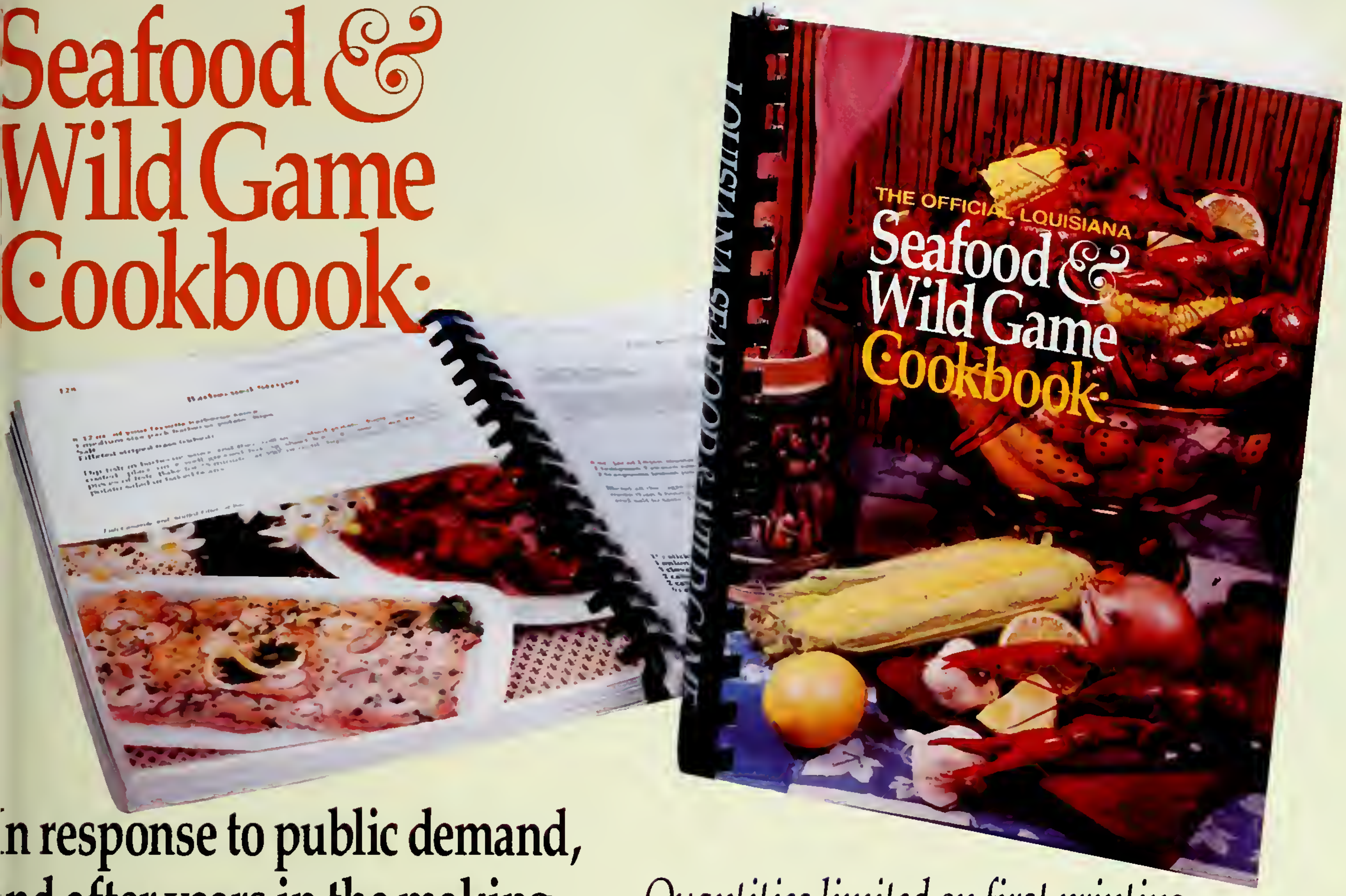
But working enforcement does not always mean mingling with questionable sorts. The story is not so one-sided and to keep the job in perspective Agent Emmett Bonner of Concordia recommends finishing out the day by checking in with model sportsmen such as Huey Womack, whose family has owned a clean and well-cared-for hunting club along the scenic Bayou Cocodrie since 1940. Mr. Womack's manner is accommodating and his respect for wildlife and fellow hunters extends into the club's policies. Browse is planted annually for wildlife feeding and records of each season's harvest (an indication of the health of the herd) are posted over the fireplace. As a safety measure, there is no drinking or card playing. High occurrence accidents such as mistaking a hunter for game are guarded against by making each hunter's stand and schedule known to everyone.

With the assistance of sportsminded outdoorsmen like these gentlemen, Enforcement's protection of the wildlife in our woodlands and waterways becomes possible. It is only reasonable that those who enjoy the outdoors and depend on it for their livelihood would be sensitive to the importance of assisting our agents in preserving our wondrous and bountiful state.

*Special thanks to Emmett Bonner of Concordia for a full day in the life of an enforcement agent.*

THE OFFICIAL LOUISIANA

# Seafood & Wild Game Cookbook



## n response to public demand, nd after years in the making, t's finally here!

*Quantities limited on first printing.*

or many years, *Louisiana Conservationist* readers ave enjoyed the delectable dishes featured in our nagazine. Many have suggested that these ecipes be collected and used as the basis for a eafood and wild game cookbook.

**The Official Louisiana Seafood & Wild Game ookbook** features over 450 superb kitchen-ested recipes and pages of beautiful photogra-hy; it makes an excellent addition to your kitchen nd a treasured gift. Inspirational sections like 'Appetizers and Beverages,'' ''Pies, Cakes and esserts,'' ''Cookies and Candies,'' along with nouth-watering main meals, make this a prized eference for discriminating food-loving cooks.

At the same time, every nickel derived from ales of the cookbook will be used to support the *ouisiana Conservationist* and further the cause of onservation.

You can receive a copy of **The Official Louisiana eafood & Wild Game Cookbook** for each tax leductible gift of $12.

*Send your check or money order to:*
**Louisiana Cookbook**
Department of Wildlife and Fisheries
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Baton Rouge, LA 70895

_______ *Please send me (the number I've indicated) copies of* **The Official Louisiana Seafood & Wild Game Cookbook.**

_______ *Enclosed is my check or money order for the stated amount. ($12 times the number of copies ordered.)*

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*Allow 4-6 weeks for delivery.*

# Conservationotes

## Bass Survey Under Way

Some 10,000 Louisiana boat owners are being surveyed on their attitudes toward black-bass fishing.

The boaters were selected by computer from registration lists maintained by the Department of Wildlife and Fisheries. They received questionnaires by mail asking about the frequency of their fishing trips, whether a minimum length for black bass should be established, what the daily catch should be and other issues. The current limit for black bass is 15 a day.

Bennie Fontenot, chief of the department's Fish Division, said survey results would be used in the formulation of bass management regulations.

"We want and need public input," Fontenot said.

## National Hunting and Fishing Day Poster Contest

A poster can be worth a $1,000 U.S. Savings Bond in the 1986 National Hunting and Fishing Day Poster Contest.

Nearly 100 national prizes, including a Grand Prize of a $1,000 savings bond, will be awarded to students who best illustrate the theme of the 1986 NHF Day Poster Contest, "Sportsmen and Conservation–Working Together for Wildlife." A total of more than $7,500 in U.S. Savings Bonds will be awarded.

Now in its ninth year, the poster contest is open to all students in grades 5-12. There are two divisions for the contest so that students can compete on a more equal basis: a Junior Division for grades 5-8 and a Senior Division for students in grades 9-12.

In order to be considered for these national awards, students' posters must first be winners in a locally sponsored National Hunting and Fishing Day Poster Contest. Posters must be received at NHF Day Headquarters by April 4, 1986.

For information on how to sponsor or participate in a local National Hunting and Fishing Day Poster Contest, write to NHF Day Poster Contest, Dept. N., P.O. Box 1075, Riverside, CT 06878.

## Public Hearings Set for 1986-87 Hunting Seasons

A series of three public hearings has been scheduled by the Louisiana Wildlife and Fisheries Commission to solicit public comment on hunting season dates, regulations and bag limits for 1986-87.

J. Burton Angelle Sr., secretary of Wildlife and Fisheries noted that one important change being considered by the commission would affect the deer season.

"What we are proposing for 1986-87 is simply to move the traditional "day after Thanksgiving" opening date for dog hunting to the first Saturday in December," he stated. "The total number of hunting days will not be affected by this change and we believe it will accommodate the wishes of deer hunters desiring a later season."

The normal deer hunting schedule for the state's wildlife management areas would not be affected by the proposal.

Hugh Bateman, Game Division chief, pointed out the department has recently conducted a hunter opinion survey to determine the attitudes of deer hunters concerning season dates. "Two out of three respondents preferred a later deer hunting season to take advantage of the wet, cool weather which is also better suited for dog hunting."

The trio of public hearings will allow interested sportsmen the opportunity to comment on the deer season proposal as well as season dates, bag limits or other regulations concerning other game.

The first public hearing is slated for 7 p.m. Wednesday, February 5, at the Natural Resources Building in downtown Baton Rouge. Other hearings will be held at the Chateau Charles in Lake Charles on March 5 and at the Holiday Inn in Natchitoches on April 3. Both hearings will also begin at 7 p.m.

## Discovery Days: March 16-22

If you want to learn about wildlife, you don't have to go very far. Your own back yard is ripe for exploration.

Even in a big city you might be able to entice a racoon to visit you. And an apartment window ledge may be just the vantage point for observing peregrine falcons wheeling about in urban canyons.

"Discover Wildlife in Your World" is the theme for the March 16-22 observance of National Wildlife Week, according to the sponsoring National Wildlife Federation. NWF is coincidentally celebrating 50 years of working for conservation.

Once again Louisiana's Department of Wildlife and Fisheries is participating fully, according to Joe L. Herring, assistant secretary for wildlife. The durable Herring is the event's state chairman for the 24th straight year.

The department's education staff is helping teachers to organize National Wildlife Week activities at all levels from kindergarten through grade 12. Kits containing display and study materials are being distributed.

## $1,000 Gift for Operation Game Thief

J. Burton Angelle Sr. (center), secretary o the Department of Wildlife and Fisheries officiates at presentation of a $1,00 check to Louisiana's antipoaching campaign. At left is Cornel J. Arceneaux president of the Louisiana chapter of th Gulf Coast Conservation Association which donated the money. Also participating is Jesse Fontenot, member of bot the GCCA national board and the citizen advisory committee of Operation Gam Thief. OGT offers rewards to citizens wh turn in poachers by phoning 1-800-442 2511.

# Bayou Kitchen

by Wayne Miller

## rabmeat Quiche

**10-inch pastry shell**
**tablespoons butter**
**/2 cup green onions**
**/2 cup chopped fresh mushrooms**
**large eggs**
**cup heavy cream**
**tablespoon tomato paste**
**/2 teaspoon salt**
**/8 teaspoon red pepper**
**cup fresh crabmeat**
**tablespoons vermouth**
**/2 cup grated cheddar cheese**

Preheat oven to 425°. Bake pricked astry shell approximately 12 mintes. Remove shell and reduce oven mperature to 375°. Melt butter; auté onions and mushrooms 5 mintes. In a bowl, beat eggs and cream; dd tomato paste, salt and pepper; ix well. Stir crabmeat and verouth into mushroom mixture and ok over low heat several minutes. our crabmeat mixture into eggs and ream and stir until combined. Pour ll mixed ingredients into pastry hell and bake. After 30 minutes, prinkle with cheese and return to ven until knife inserted in center omes out clean, approximately 10 inutes. Serves 6.

## Trout Florentine

**2 cups hollandaise sauce**
**3 tablespoons butter**
**1/2 cup chopped green onions**
**2 cups cooked spinach, well drained**
**1 cup sour cream**
**1/8 teaspoon minced garlic**
**1/4 teaspoon nutmeg**
**Salt to taste**
**Pepper to taste**
**Tabasco to taste**

Prepare hollandaise sauce. In a skillet, sauté onions in butter. Add spinach, sour cream, garlic, nutmeg, salt, pepper, and Tabasco. Mix well. Pureé. Spread spinach in bottom of buttered baking dish. Place in oven.

**4 green onions, chopped**
**2 teaspoons salt**
**6 peppercorns**
**1/2 cup dry white wine**
**1/4 cup lemon juice**
**Water**
**3 pounds trout filets**
**1/2 cup grated Swiss cheese**
**1/4 cup grated Parmesan cheese**

Preheat oven to 150°. In a skillet, place green onions, salt, peppercorns, wine, lemon juice, and water to cover filets. Bring to a boil. Add filets, lower heat, and simmer 5 minutes or until fish flakes easily. With a slotted spoon, remove and transfer to spinach-filled baking dish. Preheat broiler. Spoon hollandaise sauce on top. Sprinkle with cheeses. Broil until golden brown. Serves 6.

## Baked Oysters

**1 1/4 sticks butter**
**1/2 cup olive oil**
**1/2 cup chopped green onions**
**1/4 cup chopped fresh parsley**
**2 tablespoons minced garlic**
**1 1/3 cups seasoned bread crumbs**
**1/2 cup grated Parmesan cheese**
**1 teaspoon salt**
**1/2 teaspoon black pepper**
**1/4 teaspoon cayenne pepper**
**1 teaspoon basil**
**1 teaspoon oregano**
**4 pints oysters, drained on paper towels**

Preheat oven to 425°. In a large skillet, heat butter and oil. Sauté onion, parsley, and garlic. In a bowl, combine bread crumbs, cheese, salt, black pepper, cayenne, basil, and oregano. Add to skillet and mix well. Remove from heat and add oysters. Stir gently; put into a 2-quart baking pan. Bake 15 minutes, or until brown.

National Wildlife Week • March 16-22, 1986

# DISCOVER WILDLIFE in your WORLD

National Wildlife Federation • 50 Years Working for Conservation 1936-1986
Join and Support the National Wildlife Federation and State Affiliates